410 Rec'd PCT/PTO 1 6 MAR 2000

FORM PTO-1390 REV. 5-93 **TRANSMITTAL LETTER TO THE UNITED STATES** **DESIGNATED/ELECTED OFFICE (DO/EO/US)** **CONCERNING A FILING UNDER 35 U.S.C. 371**	US DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTORNEYS DOCKET NUMBER P00,0449 U.S.APPLICATION NO. (if known, see 37 CFR 1.5) **09/508878**

INTERNATIONAL APPLICATION NO. PCT/DE98/02732	INTERNATIONAL FILING DATE 15 September 1998	PRIORITY DATE CLAIMED 17 September 1997

TITLE OF INVENTION
PROCEDURE FOR A MOBILE UNIT TO LOG IN WITH A BASE STATION, AND COMMUNICATION SYSTEM

APPLICANT(S) FOR DO/EO/US

Gustavo Fernandez et al.

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ■ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ▫ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ■ This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay.
4. ■ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.

5. ■ A copy of International Application as filed (35 U.S.C. 371(c)(2))- drawings attached.
  a. ■ is transmitted herewith (required only if not transmitted by the International Bureau).
  b. ▫ has been transmitted by the International Bureau.
  c. ▫ is not required, as the application was filed in the United States Receiving Office (RO/US)
6. ■ A translation of the International Application into English (35 U.S.C. 371(c)(2) - drawings attached.

7. ■ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. §371(c)(3))
  a. ▫ are transmitted herewith (required only if not transmitted by the International Bureau).
  b. ▫ have been transmitted by the International Bureau.
  c. ▫ have not been made; however, the time limit for making such amendments has NOT expired.
  d. ■ have not been made and will not be made.

8. ▫ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).

9. ■ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).

10. ■ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern other document(s) or information included:
11. ■ An Information Disclosure Statement under 37 C.F.R. 1.97 and 1.98; **(PTO 1449, Prior Art, Search Report).**

12. ■ An assignment document for recording. A separate cover sheet in compliance with 37 C.F.R. 3.28 and 3.31 is included.
  (See attached envelope)

13. ■ Amendment "A" prior to action.
  ▫ A SECOND or SUBSEQUENT preliminary amendment.

14. ▫ A substitute specification.

15. ▫ A change of power of attorney and/or address letter.

16. ■ Other items or information:
  a. ■ Request for Approval of Drawing Changes-2 sheets of drawings, Figures 1 and 2.

  b. ■ EXPRESS MAIL # EL 497038197US, dated March 16, 2000.

U.S. APPLICATION NO. (if known, see 37 C.F.R. 1.5)	INTERNATIONAL APPLICATION NO.	ATTORNEY'S DOCKET NUMBER
09/508878	PCT/DE98/02732	P00,0449

17. ■ The following fees are submitted:

	CALCULATIONS	PTO USE ONLY

BASIC NATIONAL FEE (37 C.F.R. 1.492(a)(1)-(5):

Search Report has been prepared by the EPO or JPO $840.00

International preliminary examination fee paid to USPTO (37 C.F.R. 1.482) .. $670.00

No international preliminary examination fee paid to USPTO (37 C.F.R. 1.482) but international search fee paid to USPTO (37 C.F.R. 1.445(a)(2) $760.00

Neither international preliminary examination fee (37 C.F.R. 1.482) nor international search fee (37 C.F.R. 1.445(a)(2) paid to USPTO $970.00

International preliminary examination fee paid to USPTO (37 C.F.R. 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4) .... $ 96.00

ENTER APPROPRIATE BASIC FEE AMOUNT =	$840.00	
Surcharge of $130.00 for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 C.F.R. 1.492(e)).	$	

Claims	Number Filed		Number Extra	Rate		
Total Claims	12	- 20 =	0	X $ 18.00	$	
Independent Claims	03	- 3 =	0	X $ 78.00	$	
Multiple Dependent Claims				$260.00 +	$	

TOTAL OF ABOVE CALCULATIONS =	$840.00	
Reduction by 1/2 for filing by small entity, if applicable. Verified Small Entity statement must also be filed. (Note 37 C.F.R. 1.9, 1.27, 1.28)	$	
SUBTOTAL =	$	
Processing fee of $130.00 for furnishing the English translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(f)). +	$	
TOTAL NATIONAL FEE =	$840.00	
Fee for recording the enclosed assignment (37 C.F.R. 1.21(h). The assignment must be accompanied by an appropriate cover sheet (37 C.F.R. 3.28, 3.31). $40.00 per property +	$	
TOTAL FEES ENCLOSED =	$840.00	
	Amount to be refunded	$
	charged	$

a. ■ A check in the amount of $ 840.00 to cover the above fees is enclosed.

b. ☐ Please charge my Deposit Account No. _____ in the amount of $ _____ to cover the above fees. A duplicate copy of this sheet is enclosed.

c. ■ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 08-2290. A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 C.F.R. 1.494 or 1.495 has not been met, a petition to revive (37 C.F.R. 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

Steven H. Noll

SIGNATURE

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A Professional Corporation
85th Floor Sears Tower
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Steven H. Noll
NAME

28,982
Registration Number

-1-

BOX PCT

IN THE UNITED STATES ELECTED OFFICE

OF THE UNITED STATES PATENT AND TRADEMARK OFFICE

UNDER THE PATENT COOPERATION TREATY-CHAPTER II

5   APPLICANT(S):   Gustavo Fernandez et al.   DOCKET NO: P00,0449

    SERIAL NO: GROUP ART UNIT:

                                                           EXAMINER:

    INTERNATIONAL APPLICATION NO: PCT/DE98/02732

    INTERNATIONAL FILING DATE: 15 September 1998

10   INVENTION: PROCEDURE FOR A MOBILE UNIT TO LOG IN WITH

                          A BASE STATION, AND COMMUNICATION SYSTEM

Assistant Commissioner for Patents,
Washington, D.C. 20231

REQUEST FOR APPROVAL OF DRAWING CHANGES

15   Dear Sir:

        The Applicant respectfully requests approval of changes to Figures 1 and 2, marked in red and included herewith in order to label previously unlabeled blocks in Figure 1 to conform with U.S. Patent practice and to make minor word choice changes in Figure 2.
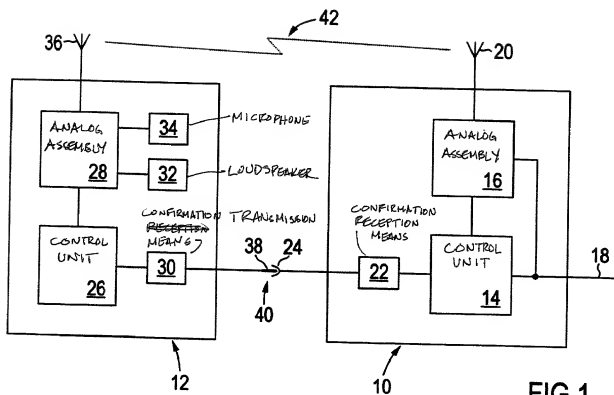
20   Respectfully submitted,

                    Steven H. Noll (Reg. No. 28,982)

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Attorneys for Applicant

FIG 1

2/2

Base Station

Mobile Unit

HS_DOWN — 50

HS_DOWN — 52

54 — Logon necessary?
- no → IDLE 56
- yes

58 — Generate identifier

64 — Search all channels

60 — Seek free channel

REG_REQ 62

66 — Further mobile unit possible?
- no → REG_REJ 68 → IDLE 70
- yes

REG_VAL_REQ 72

74 — Reply on basis?
- no → IDLE 76
- yes

78 — Generate signal on local connection

80 — REG_VAL

REG_DATA 82

84 — Store identifier and further data
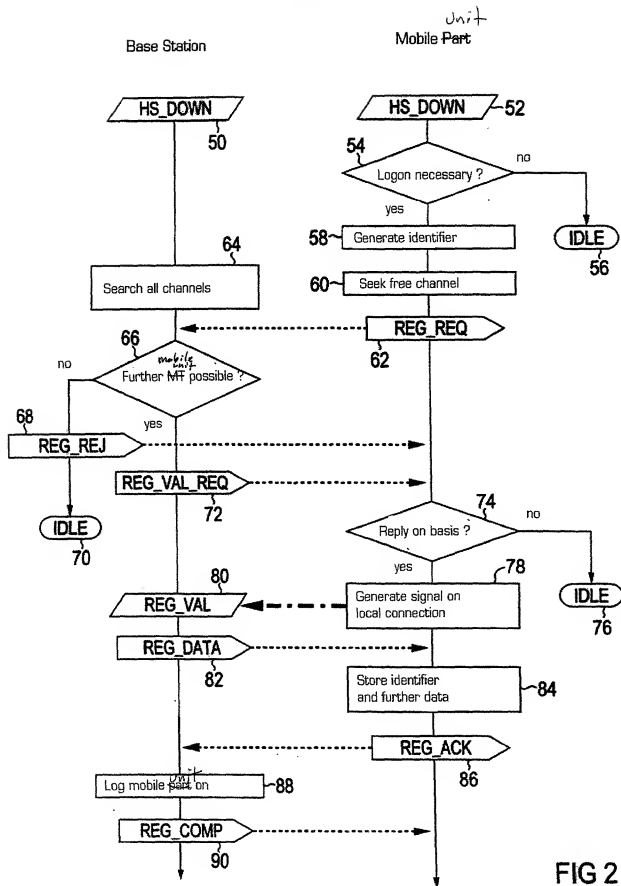
REG_ACK 86

88 — Log mobile unit on

REG_COMP 90

FIG 2

-1-

BOX PCT

IN THE UNITED STATES ELECTED OFFICE

OF THE UNITED STATES PATENT AND TRADEMARK OFFICE

UNDER THE PATENT COOPERATION TREATY-CHAPTER II

5   **AMENDMENT "A" PRIOR TO ACTION**

APPLICANT(S):	Gustavo Fernandez et al.	DOCKET NO: P00,0449
SERIAL NO:		GROUP ART UNIT:
		EXAMINER:

INTERNATIONAL APPLICATION NO: PCT/DE98/02732

10   INTERNATIONAL FILING DATE: 15 September 1998

INVENTION: PROCEDURE FOR A MOBILE UNIT TO LOG IN WITH
                    A BASE STATION, AND COMMUNICATION SYSTEM

Assistant Commissioner for Patents,
Washington, D.C. 20231

15   Sir:

         Applicants amend the above-identified PCT application as follows, and
request entry of the Amendment prior to examination in the United States National
Examination Phase.

IN THE SPECIFICATION:

20   **On substitute page 1:**

        delete lines 1-3 and insert the following:

     --METHOD AND APPARATUS FOR A MOBILE UNIT TO LOG ON WITH
            A BASE STATION, AND COMMUNICATION SYSTEM
                 BACKGROUND OF THE INVENTION--;

25   line 4, after "logging" insert --on--; and replace "part on" with --unit--;

       line 5, after "a" insert --corresponding--;

       line 6, replace "part" with --unit--;

       line 7, replace "part" with --unit--;

       line 8, replace "to CTO standard" with --according to Cordless

Telephony Standard (CT0)--;

    line 10, replace "," with --.--; and delete "for";

    line 11, replace "example" with --(e.g.,--; and after "types" insert --)--;

    line 12, replace "can" with --may--; and after "log" insert --on--;

    line 13, delete "on";

    line 14, replace "parts" with --units--;

    line 15, after "operated" insert --in--; and after "(" insert --i.e.,--;

    line 16, replace "For setting" with --To set--; and replace "parts" with --units--;

    line 18, after "log" insert --on--; and replace "parts on" with --units--;

    line 19, replace "in" (second occurrence) with --and--;

    line 20, replace "part" with --unit--;

    line 22, replace "part" with --unit--;

    line 23, replace "part" with --unit--;

    line 25, replace "US" with --U.S. Patent No.--;

    line 29, replace "part" with --unit--;

    line 30, delete "such that";

    line 31, delete "when"; and replace "part" with --unit--;

    line 32, replace "ensues in that" with --is effected by generating--; and delete "is"; and

    line 33, delete "generated"; replace "part" with --unit--; and delete "this".

    On substitute page 1a:

    line 1, replace "new code is transmitted" with --transmitting the new code--;

    line 2, replace "respectively" with --respective--; replace "the" (first occurrence) with --acknowledging--; and delete "is acknowledge";

    line 5, replace "US" with --U.S. Patent No.--;

    line 8, after "compared" insert --with a predetermined code--; replace "can be" with --is allowed to be--; and replace "with" with --out by--;

line 9, replace "part" with --unit--;

line 10, replace "code coincides" with --codes coincide--;

line 11, replace "part," with --unit.--; replace "otherwise," with --Otherwise,--; and replace "part" (second occurrence) with --unit--;

line 14, replace "part" with --unit--;

line 16, replace "part" with --unit--; and

line 17, replace "part" with --unit--; after "is" insert --,--; and after "fact" insert --,--.

On page 2:

line 2, replace "given" with --for--;

line 3, replace "this, for example, being" with --and, thus, becomes;

line 4, after "users" insert --, for example--;

after line 4, as a separate line before line 5, insert the following heading: --SUMMARY OF THE INVENTION--;

line 5, replace "said" with --the above-described--;

line 6, replace "at the same time" with --yet--; and replace "part" with "unit";

replace lines 8-9 with the following: --This and other objects are inventively achieved by the present method and apparatus. In particular, the present method includes logging a mobile unit onto a base station by first recognizing a log on situation where at least one of the mobile unit and the base station determine that the mobile unit is not logged on to the base station. Next, a identifier is generated and transmitted via a radio connection from the mobile unit to the base station. Additionally, a request for identification with an acknowledgment signal is transmitted via the radio connection from the base station to the mobile unit. In turn, the acknowledgment signal is transmitted by the mobile unit to the base station via a local connection.

Furthermore, the present invention includes a communication system having at least one mobile unit and at least one base station including a means

for recognizing a log on situation.   The communication system also includes a means for generating an identifier and a first means to transmit the identifier via a radio connection between the mobile unit and the base station. In addition, a second means is configured to transmit a request for identification with an acknowledgment signal via the radio connection between the base station and the mobile unit.   A third means is included for transmitting the acknowledgment signal via a local connection between the mobile unit and the base station.--;

line 13, replace "part" with --unit--;

line 14, replace "thereby to be understood" with --meant--;

line 15, replace "part" with --unit--;

line 17, replace "part" with --unit--;

line 20, replace "part" with --unit--;

line 21, replace 'part' with --unit--;

line 22, delete ",";

line 26, after "electrical" insert --,--; delete "or"; and after "magnetic" insert --,--;

line 27, delete "or";

line 28, replace "part" with --unit--; and replace "It" with --The system--;

line 29, replace "provided" with --configured--;

line 30, replace "part" with --unit--;

line 33, delete "especially"; and

line 34, replace "thereover" with --over the local connection--.

On page 3:

line 2, replace "part" with --unit--;

line 3, replace "part" with --unit--;

line 5, replace "part" with --unit--;

delete lines 16-17 and insert the following:

--Additional advantages and novel features of the invention will be set forth, in part, in the description that follows, and in part, will become apparent to

those skilled in the art upon examination of the following or may be learned by practice of the invention. The advantages of the invention may be realized and attained by means of the instrumentalities and combinations particularly pointed out in the appended claims.

5   BRIEF DESCRIPTION OF THE DRAWINGS--;

          lines 18-19, before "invention" insert --presently preferred--; and delete "presently preferred by the inventors";

          line 20, delete "schematic"; and replace ". Shown are" with --wherein--;

          line 21, after "1" insert --illustrates--;

10   line 23, after '2" insert --illustrates--;

          after line 23, as a separate line before line 24, insert the following heading: --DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS--;

          line 25, replace "part" with --unit--;

          line 26, replace "means" with --unit--;

15   line 28, after "antenna" insert --20--; and

          line 31, replace "part" with --unit--; after "12" insert --,--; after "turn" insert --,--; and replace "means" with --unit--.

          On page 4:

          line 6, replace "part" with --unit--;

20   line 8, replace "part" with --unit--;

          line 9, replace "part" with --unit--;

          line 10, delete ", further,";

          line 11, replace "devices" with --units--;

          line 12, delete "here"; and replace "means" with --unit--;

25   line 14, replace "means" with --unit--;

          line 15, replace "described in yet" with --will be described later in--;

          line 16, delete "later";

          line 17, replace "means" with --unit--;

          line 18, replace "part" with --unit--;

line 21, replace "part" with --unit--;

line 22, replace "part" with --unit--;

line 25, delete ", respectively,";

line 26, replace "part" with --unit--; and

5   line 30, replace "part" with --unit--.

On page 5:

line 2, replace "indicating" with --indicates--; and replace "part" with --unit--;

line 3, replace "part" with --unit--;

10   line 6, replace "means" with --unit--; replace "and" with --within--; and replace "part" with --unit--;

line 7, replace "part" (both occurrences) with --unit--;

line 8, replace "part" with --unit--;

line 11, replace "part" with --unit--;

15   line 14, replace "part" with --unit--;

line 15, replace "part" with --unit--;

line 16, replace "part" with --unit--;

line 17, replace "part" with --unit--;

line 19, replace "means" with --unit--;

20   line 20, replace "part" with --unit--;

line 21, replace "means" with --unit--;

line 23, replace "part" with --unit--;

line 27, replace "part" with --unit--; and

line 31, after "10" insert --,--; delete "-" (first occurrence); after "64"

25   insert --,--; and delete "-" (second occurrence).

On page 6:

line 2, replace ", for example 2" with --(e.g., 2).--;

line 4, replace "part" with --unit--;

line 9, replace "part" with --unit--;

line 10, delete "," (first occurrence); replace "parts" with --units--; and replace ", for example 4" with --(e.g., 4)--;

line 11, replace "part" with --unit--;

line 12, replace "a" (second occurrence) with --68) via--;

line 13, after "condition" insert --IDLE--;

line 14, replace "part" with --unit--;

line 15, replace "part" with --unit--;

line 17, replace "part" with --unit--;

line 21, replace "part" with --unit--;

line 23, replace "part" with --unit--;

line 26, delete "a" (second occurrence);

line 27, replace "part" with --unit--;

line 29, replace "part" with --unit--;

line 31, replace "part" with --unit--;

line 33, replace "part" with --unit--; and

line 34, delete "then"; and after "it" insert --then--.

On page 7:

line 2, replace "part" with --unit--;

line 3, replace "part" with --unit--;

line 10, replace "means" with --unit--;

line 11, delete ","; before "i." insert --(--; after "e." insert --,--; and after "particulars" insert --)--;

line 12, replace "functionings" with --functions--;

line 14, replace "part" with --unit--;

line 15, replace "part" with --unit--; after "flows" delete "," and insert --.--;

and replace "or an" with --Furthermore, instead of contacts,--;

     line 16, replace "connection" with --connections--;

     line 20, after "VAL" insert -- ___ --;

     line 21, after ")" insert --sent at event 78 by the mobile unit 12--;

     line 26, replace "part" with --unit--;

     line 27, replace "on" with --over--;

     line 28, replace "part" with --unit--;

     line 30, replace "part" with --unit--;

     line 32, replace "hitherto" with --previous to this point only--; and delete "only"; and

     line 33, replace "part" with --unit--.

On page 8:

     line 1, replace "part" with --unit--;

     line 4, replace "part" with --unit--;

     line 5, replace "part" with --unit--;

     line 6, replace "part" with --unit--;

     line 7, replace "part" with --unit--;

     line 8, replace "means" with --unit--;

     line 11, replace "part" with --unit--;

     line 14, replace "part" with --unit--; and

     after line 20, please insert the following:

     --While this invention has been described in connection with what is presently considered to be the most practical and preferred embodiment, it is to be understood that the invention is not limited to the disclosed embodiment, but, on the contrary, is intended to cover various modifications and equivalent arrangements included within the spirit and scope of the appended claims.--.

IN THE DRAWINGS:

Figures 1 and 2 have been amended as shown in the Request for Approval of Drawing Changes, filed concurrently herewith, in order to label blocks in Figure 1 to conform with U.S. Patent practice and to make minor word choice changes in Figure 2.

IN THE CLAIMS:

On substitute page 9, line 1, replace "**PATENT CLAIMS**" with --<u>WHAT IS CLAIMED IS:</u>.

Delete claims 1 and 11 without prejudice or disclaimer.

Please amend claims 2-10 as follows.

2.   (Amended)   <u>The method</u> [Method] according to claim [1] <u>12</u>, [characterized in that] <u>wherein</u> the local connection [(40)] is <u>selected from the group consisting of</u> an electrical <u>connection,</u> [or] <u>a</u> magnetic <u>connection,</u> [or] <u>an</u> inductive <u>connection and an</u> [or] optical connection.

3.   (Amended)   <u>The method</u> [Method] according to claim [1] <u>12</u>, [characterized in that] <u>wherein</u> the local connection [(40)] is an electrical connection [that is produced via] <u>of respective</u> charging contacts [(24, 38) between] <u>of</u> the mobile <u>unit</u> [part (12)] and the base station [(10)].

4.   (Amended)   <u>The method</u> [Method] according to [one of the claims 1 through 3] <u>claim 12</u>, [characterized in that] <u>wherein</u> a binary signal is transmitted via the local connection [(40)].

5.   (Amended)   <u>The method</u> [Method] according to [one of the claims 1 through 4] <u>claim 12</u>, [characterized in that, in] <u>wherein the</u> step <u>of recognizing</u> [a), the recognition (50, 52, 54) by] the logon situation is triggered when the mobile <u>unit</u> [part (12)] is placed onto the base station [(10)].

6.   (Amended)   The method [Method] according to [one of the claims 1 through 5] claim 12, [characterized in that, in] wherein the step [b),] of generating the identifier [is generated] includes generating the identifier as a random number.

5   7.   (Amended)   The method [Method] according to [one of the claims 1 through 6] claim 12, [characterized in that, in step b), wherein the identifier is generated by the mobile [part (12)] unit and is transmitted to the base station [(10)] in the step [c)] of transmitting the identifier via the radio connection.

8.   (Amended)   The method [Method] according to [one of the claims 1 10 through 7] claim 12, [characterized in that, in] wherein [step e),] the [confirmation] acknowledgment signal is generated by the mobile [part (12)] unit and is transmitted to the base station [(10)].

9.   (Amended)   The method [Method] according to [one of the claims 1 through 8] claim 12, [characterized in that, in step e),] wherein the [confirmation] 15 acknowledgment signal is transmitted within a predetermined time interval [as reaction] in response to a request [(REG__VAL__REQ)] signal transmitted via the radio connection [(42)].

10.   (Amended)   The method [Method] according to [one of the claims 1 through 9] claim 12 further comprising [, characterized by] the [further] step of: 20   [e)]   transmitting [(82)] logon data via the radio connection [(42)].

Please add new claims 12-14 as follows.

12.   A method for logging a mobile unit on at a base station comprising the steps of:

recognizing a logon situation wherein at least one of the mobile unit 25 and the base station determines that the mobile unit is not yet logged on at the

base station;

      generating an identifier;

      transmitting the identifier via a radio connection between the mobile unit and the base station;

5   requesting identification with an acknowledgment signal via transmission over the radio connection between the mobile unit and the base station; and

      transmitting the acknowledgment signal via a local connection between the mobile unit and the base station.

10   13.   A communication system having at least one mobile unit and at least one base station, comprising:

      a means for recognizing a logon situation;

      a means for generating an identifier;

      a radio connection between the at least one mobile unit and the at

15   least one base station;

      a local connection between the at least one mobile unit and the at least one base station;

      a first means for transmitting the identifier via the radio connection; and

      a second means for transmitting a request for identification with an

20   acknowledgment signal via the radio connection; and

      a third means for transmitting the acknowledgment signal via the local connection.

    14.   An apparatus having at least one mobile unit and a base station comprising:

25   a base station having a first control unit, a confirmation receiver, a first charging connector connected to the confirmation receiver and a first analog assembly configured for sending and receiving radio frequency signals;

at least one mobile unit having a second control unit, a confirmation transmitter, a second charging connector connected to the confirmation transmitter and a second analog assembly configured for sending and receiving radio frequency signals;

5   a radio connection between the base station and the at least one mobile unit via the first and second analog assemblies; and

a local connection formed by the connection of the first and second charging connectors;

wherein the first and second control units are configured to detect a
10   logon of the at least one mobile unit to the base station; the second control unit generates an identifier and sends the identifier to the second analog assembly; the second analog assembly transmits a first data frame including the identifier to the first analog assembly via the radio connection; the first analog assembly is configured to receive the first data frame and send the first data frame to the
15   first control unit and transmit an acknowledgment signal to the second analog assembly via the radio connection in response to the first control unit; and the confirmation transmitter transmits the acknowledgment signal to the confirmation receiver via the local connection in response to receiving the acknowledgment signal in the second analog assembly.

20   **IN THE ABSTRACT**

On page 11:

replace lines 1-12 with the following new abstract:

--**ABSTRACT**

Method and Apparatus for a Mobile Unit to Log on with a Base Station, and
25   Communication System

A method for logging a mobile unit on at a base station including the steps of recognizing a logon situation, generating an identifier, transmitting the identifier via a radio connection between the mobile unit and the base station,

and transmitting a confirmation via the local connection between the mobile unit and the base station. A corresponding communication system is configured for the implementation of the method. The invention creates a simple and, at the same time, dependable method for logging a mobile unit on at a base station.--.

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<div align="center">

REMARKS

</div>

The present amendment makes editorial changes to the specification, drawings, claims and Abstract in order to conform to United States Patent Practice. Additionally, the Applicants include herewith a copy of the new Abstract on a separate page. None of the changes in the claims is intended as

10 a surrender of any of the subject matter within the scope of the original claim language since, as noted above, all of these changes have been made solely to bring the claims into conformity with the requirements of 35 U.S.C. §112, second paragraph.

Early consideration of the application is respectfully requested.

15 Respectfully submitted,

Steven H. Noll (Reg. No. 28,982)

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Attorneys for Applicant

ABSTRACT

Method and Apparatus for a Mobile Unit to Log on with a Base Station, and
Communication System

5   A method for logging a mobile unit on at a base station including the steps of
recognizing a logon situation, generating an identifier, transmitting the identifier via a
radio connection between the mobile unit and the base station, and transmitting a
confirmation via the local connection between the mobile unit and the base station. A
corresponding communication system is configured for the implementation of the
10   method. The invention creates a simple and, at the same time, dependable method for
logging a mobile unit on at a base station.

SPECIFICATION

PROCEDURE FOR A MOBILE UNIT TO LOG IN WITH A BASE STATION, AND COMMUNICATION SYSTEM

5

The invention is directed to a method for logging a mobile part on at a base station and is also directed to a communication system. The invention is particularly employable for telephone systems having at least one mobile part and at least one base station. The mobile part can thereby be a cordless telephone, particularly an analog telephone to CT0 standard. The invention, however, can also be employed in other communication systems wherein a dependable allocation between mobile parts and base stations is required, for

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example for remote controls of all types.

It can be necessary in a telephone system to log a cordless telephone on at a base station and to thus register it. This, for example, is the case in what are referred to as concentrator systems, wherein a plurality of mobile parts

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can be operated parallel (without the possibility of internal connections) at a base station. For setting up such a system, a plurality of mobile parts must be allocated to the base station, and it is desirable for later expansion to also be able to log new mobile parts on at the base station.

In telephone systems that are only composed of a single base station in

20

a single mobile part, as well, the possibility of flexible log on is desirable. As a result thereof, the production of the telephone system is facilitated because no consideration must be given to a paired allocation of mobile part and base station. Further, a lost or malfunctioning mobile part can simply be replaced by a new one in this case.

25

US 5,500,888 discloses a cordless telephone that comprises a means for enhancing the security of the cordless telephone with respect to unauthorized use of the telephone and with respect to unauthorized tapping. To this end, this means is fashioned such that a security code is stored in the mobile part and the base station upon initial commissioning

30

of the telephone and such that this stored security code is automatically modified every time when the mobile part is located on the base station for charging the battery. This modification of the code ensues in that a new code is generated from a random number in the mobile part or the base station, this

new code is transmitted via the radio interface of the telephone to the respectively other side, and the transmission of the code is acknowledge to the code sender by the code receiver via the radio interface.

5   US 4,736,404 discloses a cordless telephone that comprises a means for enhancing the security of the cordless telephone with respect to unauthorized use of the telephone. To this end, this means is fashioned such that a security code is compared before telephoning can be carried with the mobile part of the telephone via the base station. When the comparison shows

10   that the code coincides, then telephoning can be carried out with the mobile part; otherwise, the mobile part is rejected as unauthorized. For preparation of the code comparison, a predetermined signal code stored in the base station is communicated from the base station via the charging contacts and the charging line when the mobile part is initially located on the base station for charging the

15   battery, and the reception of the signal code is acknowledged to the base station from the mobile part.

     The log on of a mobile part at a base station is in fact fundamentally possible given known telephone systems according to the CT0 standard; however, complicated authentication routines must be run for this purpose. The

20   reasons for this is that this standard is susceptible to foreign use and what is to be precluded is that, for example, a neighbor logs on at the base station of a user and then telephones at the expense of this user. The authentication routine therefore requires at least the input of a PRN code.

The entire operation is complicated and susceptible to error. Particularly given simpler devices without a display, the input of a number of numerical codes from a printed operating instruction is required, this, for example, being a deterrent for inexperienced users.

It is therefore an object of the invention to solve said problems and offer a simple and, at the same time, dependable possibility for logging a mobile part on at a base station that requires outwardly little hardware and software outlay.

This object is inventively achieved by a method having the features of claim 1 as well as by a communication system having the features of claim 11.

The invention is based on the fundamental idea of transmitting the identifier required for the log on via the ordinary radio connection between the mobile part and the base station and additionally providing a confirmation that is transmitted via a local connection between the mobile part and the base station. What is thereby to be understood by a local connection is any connection that assures spatial proximity between the mobile part and the base station.

The inventive method is dependable due to the use of a local connection, since a mobile part can only be logged on when it is spatially located adequately close to the base station. A neighbor or some other unauthorized person who has no access to the rooms in which the base station is located cannot log a mobile part on. Since the identifier is communicated via the radio connection that already exists between the mobile part and the base station, no additional outlay or only slight additional outlay is required for this purpose. The additional, local connection likewise incurs only slight outlay because only extremely little information need be transmitted over this connection and the simplest embodiments therefore already suffice.

In preferred embodiments, the local connection is an electrical or magnetic or inductive or optical connection. In particular, the local connection can assure a direct or nearly direct contact between the base station and the mobile part. It can be provided, for example, to set the local connection up via the charging contacts that already exist between the mobile part and the base station. The circuit required in this purpose for generating or, respectively, recognizing a confirmation signal is not complicated.

The local connection can be especially simply set up when a binary signal is transmitted thereover. An information set of only one bit is preferably transmitted

via the local connection at every log on event. This suffices for the reliable allocation of base station and mobile part.

Every time the mobile part hangs up, a check is preferably undertaken at the base station to see whether a log on should be undertaken. A re-log on is not required, in particular, when the mobile part is already logged on thereat or at some other base station.

In particular, the identifier serves for the allocation of the mobile part to the base station. In preferred embodiments, the identifier is defined by the mobile part of the base station as a random number. The identifier and/or the confirmation is preferably generated by the mobile part and transmitted therefrom to the base station. In preferred embodiments, the base station receives the identifier and requests the confirmation from the mobile part. A log on is preferably successful when the confirmation signal is generated in a predetermined time window following this request. In further steps, further data, for example log on data, can then be communicated via the radio connection.

In preferred embodiments, the communication system comprises the features recited above.

An exemplary embodiment of the invention presently preferred by the inventors as well as a plurality of alternative embodiments are explained in greater detail with reference to the schematic drawings. Shown are:

FIG. 1 a block circuit diagram of components of a communication system that are relevant for the invention; and

FIG. 2 a flow chart of a log on method.

The communication system shown in Fig. 1 is an analog telephone system according to CT0 standard having a base station 10 and a mobile part 12 fashioned as cordless telephone. The base station 10 comprises a control means 14 and an analog assembly 16 that are connected to one another as well as to an exchange line 18. An antenna is connected to the analog assembly 16 for sending and receiving radio frequency signals. The control means 14 is connected via a confirmation reception means 22 to a charging contact 24 fashioned as two-pole contact.

The mobile part 12 in turn comprises a control means 26 that is connected to an analog assembly 28 as well as to a confirmation transmission means 30. A loudspeaker 32, a microphone 34 and an antenna 36 are connected to the analog

assembly 28. The confirmation transmission means 30 is in communication with a two-pole charging contact 38.

The telephone system contains further assemblies, for example operating elements, display devices or power supply devices. These assemblies are well known and are not shown in the schematic illustration of Fig. 1

in Fig. 1, the mobile part 12 is placed onto the base station 10 fashioned as charging device, so that the two, respective two-pole charging contacts 24 and 38 are connected to one another. An accumulator of the mobile part 12 (not shown in Fig. 1) is charged via these contacts 24 and 38. When the mobile part 12 is hung up, further, there is a local connection 40 between the two control devices 26 and 14. The local connection 40, which is an electrical line connection here, proceeds from the control means 26 via the confirmation transmission means 30, the two charging contacts 38 and 24 and the confirmation reception means 22 to the control means 14. A confirmation signal can be communicated via the local connection 40 from the mobile part 12 to the base station 10, as described in yet greater detail later.

A call incoming on the exchange line 18 is recognized by the control means 14 and is signaled to the mobile part 12 via a radio connection 42 that proceeds via the analog assembly 16, the antenna 20, the antenna 36 and the analog assembly 28. The base station 10 then sends an identifier identifying the mobile part 12 via the radio connection 42. In a corresponding way, a connection request proceeding from the mobile part 12 is communicated to the base station 10 via the radio connection 42. During a telephone call, further, the radio connection 42 serves as duplex connection for the transmission of the call between the loudspeaker 32 or, respectively, the microphone 34 and the exchange line 18.

The executive sequence shown in Figure 2 begins when the mobile part 12 is placed onto the base station 10. The diagram of Figure 2 is based on a notation similar to the description language SDL. The executive sequence in the base station 10 is shown in the left-hand column, and the executive sequence in the mobile part 12 is shown in right-hand column. The thin, broken-line arrows between the sequence lanes represent communication events via the radio connection 42, whereas the thicker, dot-dash arrow identifies the communication of a confirmation signal via the local connection 40.

Both sequence lanes in Fig. 2 begin with the event HS __ DOWN (events 50 or, respectively, 52). This event indicating when the mobile part 12 is hung up is recognized in the base station 10 and in the mobile part 12 by a respective, suitable circuit that measures the battery charging current flowing via the contacts 24 and 38.

The control means 26 and the mobile part 12 now checks whether a logon of the mobile part 12 is required. A mobile part 12 already logged on at this base station 10 or at some other base station need no longer be logged on again. In the query 54, the mobile part 12 therefore determines whether an identifier for allocation to a base station 10 is already stored in it. When this is the case, a logon is not required, and the mobile part 12 switches into a quiescent condition IDLE (condition 56) in which it is merely supplied with a charging voltage by the base station 10.

When, in contrast, no identifier is stored in the mobile part 12, then a logon is required. This case occurs the first time a new mobile part 12 is placed onto a base station 10. The identifier of a mobile part 12 can also be erased with a suitable command sequence when, for example, the mobile part 12 is to be logged over onto a different base station 10. The logon procedure is also run in this case.

As first step of the actual logon method, the control means 26 of the mobile part 12 generates a new identifier as a 16 bit wide random number (step 58). A 16 bit wide binary counter is provided for this purpose in the control means 26, this being counted up with a predetermined counting rate during the operation of the mobile part 12. This counter is arrested upon recognition of the event 52 (HS __ DOWN), and the counter reading that has been reached serves as provisional identifier that must still be transmitted to the base station 10 and confirmed in the following logon procedure.

In step 60, the mobile part 12 then seeks a free radio channel and continuously transmits a data frame REG __ REQ via the radio connection 42 (transmission event 62) over a predetermined time. The data frame REG __REQ contains the provisional identifier determined in step 58. In the meantime, the base station 10 - in step 64 - searches all available channels (for example 10 or 25 channels) for an incoming data frame REG _ REQ. This channel sweep (scanning) is triggered by the event 50 (HS __ DOWN) in the base station 10.

The base station 10 only implements a predetermined number of complete channel sweeps, for example 2. When no data frame REG __ REQ is received during these channel sweeps, the base station 10 assumes that a logon is not required and that the mobile part 12 is in the quiescent condition 56. The base station 10 then aborts the search and also in turn switches into a quiescent condition.

When, in contrast, the base station 10 has received the data frame REG __ REQ during the search in step 64, then it checks in a query 66 to see whether a further mobile part 12 can be logged on. Each base station 10 can only service a predetermined, maximum number of mobile parts 12, for example 4. When the base station 10 is already fully burdened or denies the logon of the mobile part 12 for some other reasons, it sends a data frame REG __ REJ (transmission event a the radio connection 42 and then switches into a quiescent condition 70. A negative acknowledgment done is triggered at the mobile part 12 as reaction to the data frame REG __ REJ. In response thereto, the mobile part 12 also ends the logon procedure.

When, in contrast, the logon of the mobile part 12 is possible from the point of view of the base station 10, then the base station 10 sends a data frame REG __ VAL __ REQ (transmission event 72) via the radio connection 42. The data frame REG __ VAL __ REQ contains the provisional identifier transmitted by the transmission event 62. This data frame represents the request for the mobile part 12 to identify itself with a suitable hardware signal.

As already mentioned, the mobile part 12 continuously sends the data frame REG ___ REQ (transmission event 62) and waits for a reply from the base station 10 in the meantime. When no reply has been received up to the expiration of the predetermined waiting time, a time error (timeout) is triggered in a query 74, and the mobile part 12 switches into a quiescent condition 76. The failure of a reply to arrive can have been caused by a malfunction of the radio connection 42. A further possible reason is that the mobile part 12 has not been placed onto a fully functional base station 10 but only onto a charging dish. In this case, the mobile part 12 nonetheless begins the logon procedure since the event 52 (HS _ DOWN) is recognized on the basis of the battery charging current.

When the mobile part 12 has received the data frame REG __ VAL __REQ within the predetermined time window, then it sends a corresponding confirmation

via the local connection 40 (step 78). This confirmation is the indication that the logon is in fact implemented with the mobile part 12 resting on the base station 10 (and not, for instance, with some other mobile part).

In the exemplary embodiment described here, the confirmation is transmitted as an electrical voltage signal via the charging contacts 24 and 38. The confirmation transmission means 30 offers a suitably modulated signal for this purpose, this differing from the normal charging voltage as well as from signals that can arise given potential incorrect contacts. The confirmation reception means 22 filters such disturbances out and conducts a recognized confirmation signal to the control means 14. The confirmation signal merely communicates an informational content of one bit, i.e. does not contain any identifier or other particulars.

Other functionings of the local connection 40 are possible in alternative embodiments. For example, other electrical contacts between the base station 10 and the mobile part 12 can be employed instead of the charging contacts 24 and 38 via which the charging current for the mobile part 12 also flows, or an inductive, magnetic or optical connection can be utilized. More complex confirmation messages are employed in other alternative embodiments in order to further enhance the dependability.

When the confirmation is received at the base station 10 within a predetermined time span after the transmission of the data frame REG __ VAL REQ, this is recognized as event REG_VAL (event 80). When the confirmation does not arrive or arrives too late, the logon procedure is aborted.

As reaction to the event 80 (REG_VAL), the base station 10 sends a data frame REG_DATA (transmission event 82) that contains all required logon data via the radio connection 42. In the exemplary embodiment described here, these are the identifier, an index number of the mobile part 12, and two or more identifiers for those radio channels on which the future communication between the base station and the mobile part 12 should ensue. In alternative embodiments, further or other logon data can be transmitted.

When the mobile part 12 receives the data frame REG_DATA, it stores the communicated logon data in step 84. The identifier, which was generated by the mobile part in step 58, has hitherto been considered only as a provisional identifier. In step 84, it is now stored in the mobile part 12 as final, confirmed identifier.

The mobile part 12 confirms the correct reception of the logon data with a data frame REG___ACK that is transmitted to the base station via the radio connection 42 (transmission event 86). When, in contrast, the logon data do not arrive at the mobile part 12 within a predetermined time span, the logon is aborted. The mobile part 12 then outputs a negative acknowledgment tone.

The logon of the mobile part 12 in the base station 10 is completed in step 88. With the identifier that has now been confirmed, the mobile part 12 is entered in a logon list maintained by the control means 14. The successful termination of this event is acknowledged by the base station 10 with a data frame REG__COMP (transmission event 90). The date frame REG__COMP contains the identifier and is transmitted via the radio connection 42. The mobile part 12 signals the reception of this data frame with a positive acknowledgment tone in order to confirm the successful logon for the user. When, in contrast, the data frame REG__COMP does not arrive or arrives too late, the mobile part 12 generates a negative acknowledgment tone and erases the logon data stored in step 84.

Other configurations and time sequences of the communication protocol are possible in alternative embodiments of this method. In particular, more or fewer messages can be exchanged or the roles of the transmitters and receivers of these messages can be entirely or partially interchanged. Further, an adaptation of the method to communication systems other than mobile telephones is possible.

PATENT CLAIMS

     1.   Method for logging a mobile part (12) on at a base station (10), particularly in a telephone system, comprising the steps:

a)   recognizing (50, 52, 54) a logon situation in that the mobile part (12) or the base station (10) determines that the mobile part (12) is not yet logged on at the base station (10);

b)   generating (58) an identifier;

c)   transmitting (62) the identifier via a radio connection (42) between the mobile part (12) and the base station (10); and

d)   transmitting (72) a request for identification with an acknowledge signal via the radio connection (42) between the mobile part (12) and the base station (10; and

e)   transmitting (78) the acknowledgment signal via a local connection (40) between the mobile part (12) and the base station (10).

     2.   Method according to claim 1, characterized in that the local connection (40) is an electrical or magnetic or inductive or optical connection.

     3.   Method according to claim 1, characterized in that the local connection (40) is an electrical connection that is produced via charging contacts (24, 38) between the mobile part (12) and the base station (10).

     4.   Method according to one of the claims 1 through 3, characterized in that a binary signal is transmitted via the local connection (40).

     5.   Method according to one of the claims 1 through 4, characterized in that, in step a), the recognition (50, 52, 54) by the logon situation is triggered when the mobile part (12) is placed onto the base station (10).

     6.   Method according to one of the claims 1 through 5, characterized in that, in step b), the identifier is generated as random number.

7.   Method according to one of the claims 1 through 6, characterized in that, in step b), the identifier is generated by the mobile part (12) and is transmitted to the base station (10) in step c).

8.   Method according to one of the claims 1 through 7, characterized in that, in step e), the confirmation signal is generated by the mobile part (12) and is transmitted to the base station (10).

9.   Method according to one of the claims 1 through 8, characterized in that, in step e), the confirmation signal is transmitted within a predetermined time interval as reaction to a request (REG__VAL__REQ) transmitted via the radio connection (42).

10.   Method according to one of the claims 1 through 9, characterized by the further step:

e)   transmitting (82) logon data via the radio connection (42).

11.   Communication system, particularly telephone system, having at least one mobile part (12) and at least one base station (10), comprising the following features:

a)   means (14, 24, 26, 38) for recognizing (50, 52, 54) a logon situation;

b)   means (14, 26) for generating (58) an identifier

c)   first means (14, 16, 20, 26, 28, 36) for transmitting (62) the identifier via a radio connection (42) between the mobile part (12) and the base station (10); and

d)   the first means (14, 16, 20, 26, 28, 36) for transmitting (72) a request for identification with an acknowledge signal via the radio connection (42) between the mobile part (12) and the base station (10);

e)   second means (14, 22, 26, 30) for transmitting (78) the acknowledge signal via a local connection (40) between the mobile part (12) and the base station (10).

ABSTRACT

Procedure for a Mobile Unit to Log in with a Base Station, and Communication System

A method for logging a mobile part on at a base station comprises the steps of recognizing a logon situation (50, 52, 54), generating an identifier (58), transmitting (62) the identifier via a radio connection between the mobile part and the base station, and transmitting (78) a confirmation via the local connection between the mobile part and the base station. A communication system is configured for the implementation of such a method. The invention creates a simple and, at the same time, dependable possibility for logging a mobile part on at a base station.
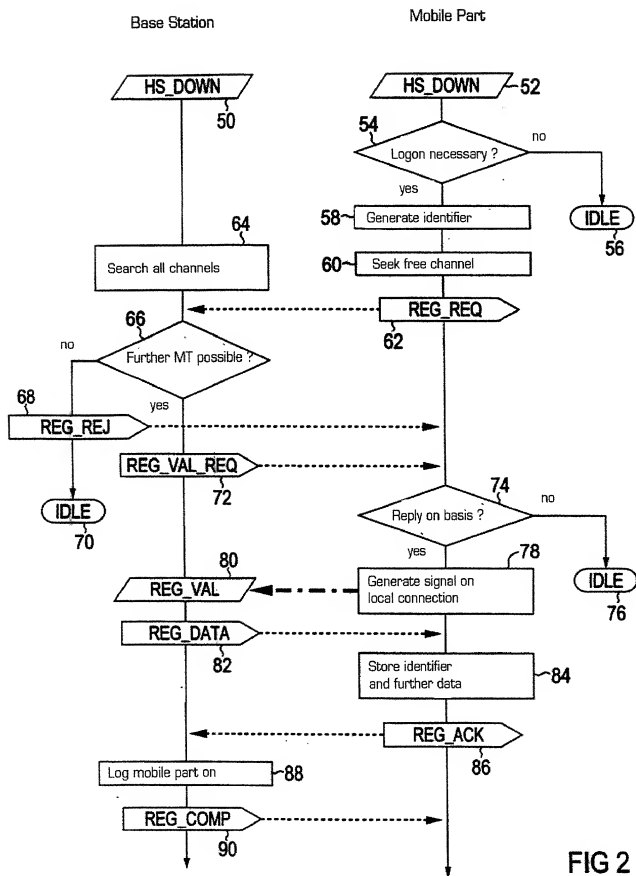
FIG. 2

FIG 1
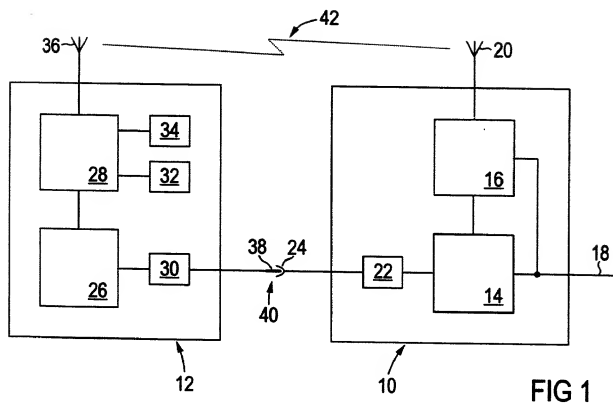
FIG 2

Declaration and Power of Attorney For Patent Application
Erklärung Für Patentanmeldungen Mit Vollmacht
German Language Declaration

Als nachstehend benannter Erfinder erkläre ich hiermit an Eides Statt:

As a below named inventor, I hereby declare that:

dass mein Wohnsitz, meine Postanschrift, und meine Staatsangehörigkeit den im Nachstehenden nach meinem Namen aufgeführten Angaben entsprechen,

My residence, post office address and citizenship are as stated below next to my name,

dass ich, nach bestem Wissen der ursprüngliche, erste und alleinige Erfinder (falls nachstehend nur ein Name angegeben ist) oder ein ursprünglicher, erster und Miterfinder (falls nachstehend mehrere Namen aufgeführt sind) des Gegenstandes bin, für den dieser Antrag gestellt wird und für den ein Patent beantragt wird für die Erfindung mit dem Titel:

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

Verfahren zum Anmelden eines Mobil-
teils an einer Basisstation und Kommuni-
kationssystem

_____

_____

_____

deren Beschreibung

the specification of which

(zutreffendes ankreuzen)

(check one)

[X] hier beigefügt ist.

☐ is attached hereto.

☐ am _____ als
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PCT Anmeldungsnummer _____
eingereicht wurde und am _____
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I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims as amended by any amendment referred to above.

Ich erkenne meine Pflicht zur Offenbarung irgendwelcher Informationen, die für die Prüfung der vorliegenden Anmeldung in Einklang mit Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) von Wichtigkeit sind, an.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a)

Ich beanspruche hiermit ausländische Prioritätsvorteile gemäss Abschnitt 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 119 aller unten angegebenen Auslandsanmeldungen für ein Patent oder eine Erfinderurkunde, und habe auch alle Auslandsanmeldungen für ein Patent oder eine Erfinderurkunde nachstehend gekennzeichnet, die ein Anmeldedatum haben, das vor dem Anmeldedatum der Anmeldung liegt, für die Priorität beansprucht wird.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Form PTO-FB-240 (8-83) Patent and Trademark Office-U.S. DEPARTMENT OF COMMERCE

German Language Declaration

Prior foreign applications
Priorität beansprucht

Priority Claimed

197 40 934.2	Germany	17. September 1997	☒	☐
(Number)	(Country)	(Day Month Year Filed)	Yes	No
(Nummer)	(Land)	(Tag Monat Jahr eingereicht)	Ja	Nein

			☐	☐
(Number)	(Country)	(Day Month Year Filed)	Yes	No
(Nummer)	(Land)	(Tag Monat Jahr eingereicht)	Ja	Nein

			☐	☐
(Number)	(Country)	(Day Month Year Filed)	Yes	No
(Nummer)	(Land)	(Tag Monat Jahr eingereicht)	Ja	Nein

Ich beanspruche hiermit gemäss Absatz 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 120, den Vorzug aller unten aufgeführten Anmeldungen und falls der Gegenstand aus jedem Anspruch dieser Anmeldung nicht in einer früheren amerikanischen Patentanmeldung laut dem ersten Paragraphen des Absatzes 35 der Zivilprozeßordnung der Vereinigten Staaten, Paragraph 122 offenbart ist, erkenne ich gemäss Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) meine Pflicht zur Offenbarung von Informationen an, die zwischen dem Anmeldedatum der früheren Anmeldung und dem nationalen oder PCT internationalen Anmeldedatum dieser Anmeldung bekannt geworden sind.

I hereby claim the benefit under Title 35. United States Code. §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §122, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occured between the filing date of the prior application and the national or PCT international filing date of this application

(Application Serial No.)	(Filing Date)	(Status)	(Status)
(Anmeldesenennummer)	(Anmeldedatum)	(patentiert, anhängig, aufgegeben)	(patented, pending, abandoned)

(Application Serial No.)	(Filing Date)	(Status)	(Status)
(Anmeldeseriennummer)	(Anmeldedatum)	(patentiert, anhängig, aufgeben)	(patented, pending, abandoned)

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German Language Declaration

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And I hereby appoint

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Bundesrepublik Deutschland	
Voller Name des sechsten Miterfinders (falls zutreffend)	Full name of sixth joint inventor, if any
Unterschrift des Erfinders Datum	Inventor's signature Date
Wohnsitz	Residence
Staatsangehörigkeit	Citizenship
Postanschrift	Post Office Address

(Bitte entsprechende Informationen und Unterschriften im Falle von dritten und weiteren Miterfindern angeben)

(Supply similar information and signature for third and subsequent joint inventors).